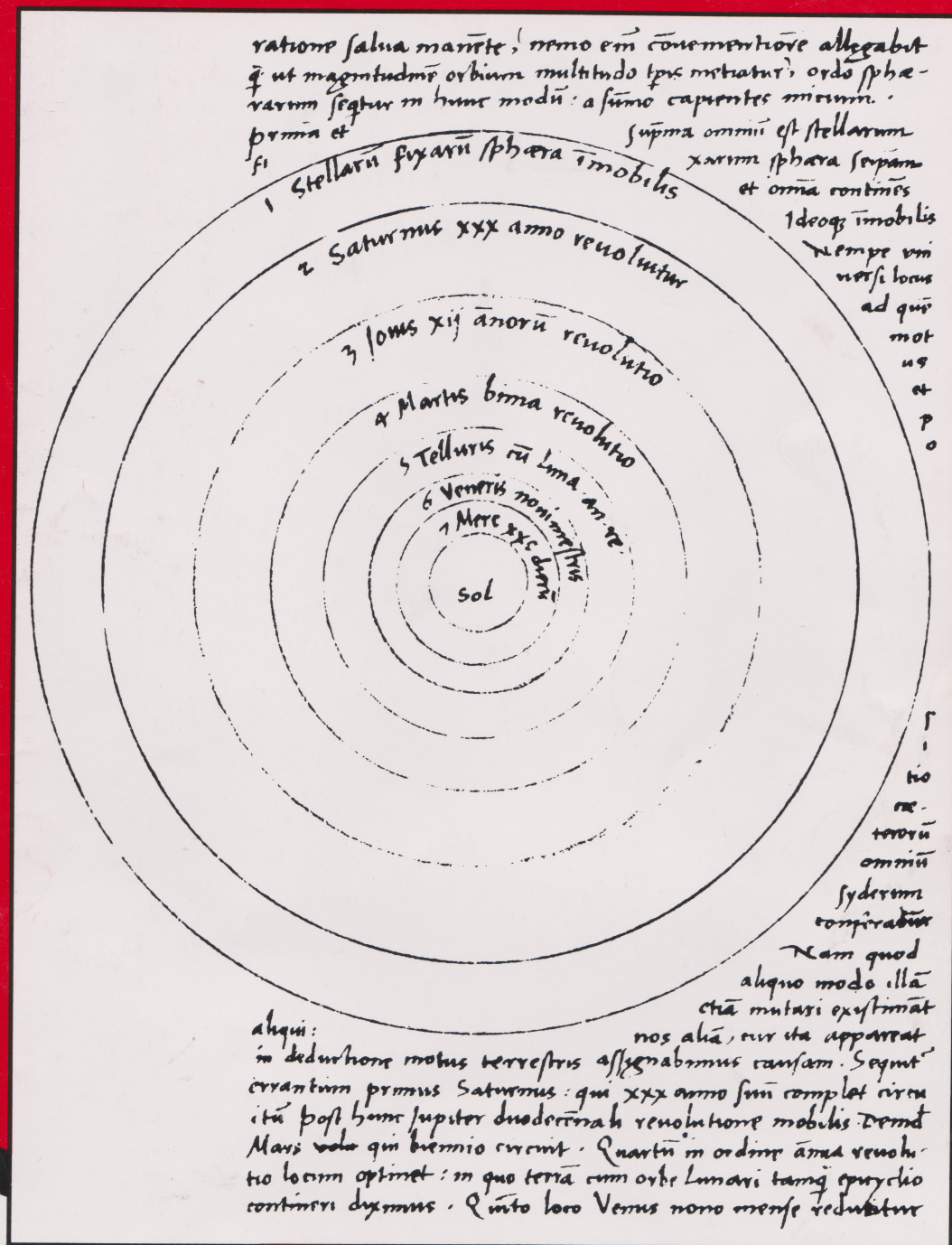




SCIENCE



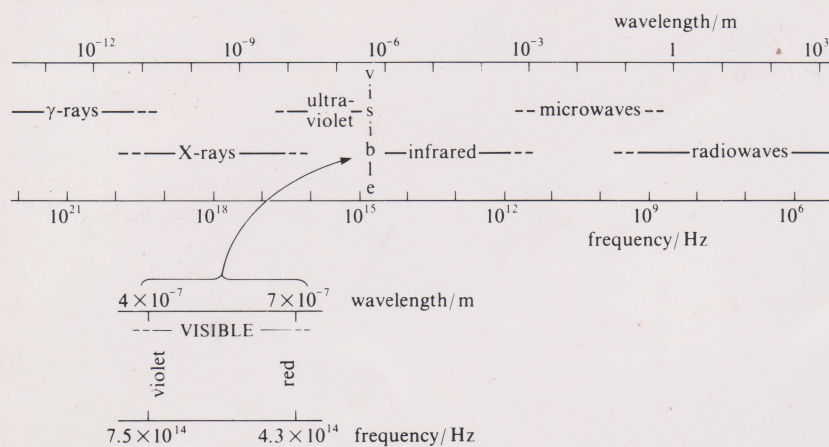
Unit 1
Science and the planet Earth

Unit 2
Measuring the Solar System

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USEFUL INFORMATION FOR THE PHYSICS AND GENERAL SCIENCE UNITS

ELECTROMAGNETIC SPECTRUM



PHYSICAL CONSTANTS

Symbol	Quantity	Approximate value
G	gravitational constant	$6.672 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
c	speed of light in a vacuum	$2.998 \times 10^8 \text{ m s}^{-1}$
h	Planck's constant	$6.626 \times 10^{-34} \text{ J s}$
e	magnitude of the charge of the electron	$1.602 \times 10^{-19} \text{ C}$
m_e	mass of the electron	$9.110 \times 10^{-31} \text{ kg}$
m_n	mass of the neutron	$1.675 \times 10^{-27} \text{ kg}$
m_p	mass of the proton	$1.673 \times 10^{-27} \text{ kg}$

USEFUL QUANTITIES AND CONVERSIONS

$\pi \approx 3.142$	Earth radius (equatorial) $\approx 6.38 \times 10^6 \text{ m}$
1 mile $\approx 1.609 \text{ km}$	circumference of the Earth (distance round the Equator) $\approx 4.01 \times 10^7 \text{ m}$
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1 centimetre (cm) $\approx 0.3937 \text{ inch}$	
1 kilocalorie $\approx 4187 \text{ J}$	
1 electronvolt (eV) $\approx 1.602 \times 10^{-19} \text{ J}$	Earth-Sun distance (i.e. orbital radius of the Earth) $\approx 1.50 \times 10^{11} \text{ m}$
1 radian $\approx 57.296 \text{ degrees}$	
1 degree $\approx 0.01745 \text{ radian}$	Earth-Moon distance (i.e. orbital radius of the Moon) $\approx 3.84 \times 10^8 \text{ m}$
1 GeV/ $c^2 \approx 1.783 \times 10^{-27} \text{ kg}$	

SI02 UNITS

1	Science and the planet Earth	19	Life and evolution
2	Measuring the Solar System	20	Inheritance and cell division
3	Motion under gravity	21	Genes and evolution
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16	Chemical energetics		
17-18	The chemistry of carbon compounds	32	The search for fundamental particles



SCIENCE

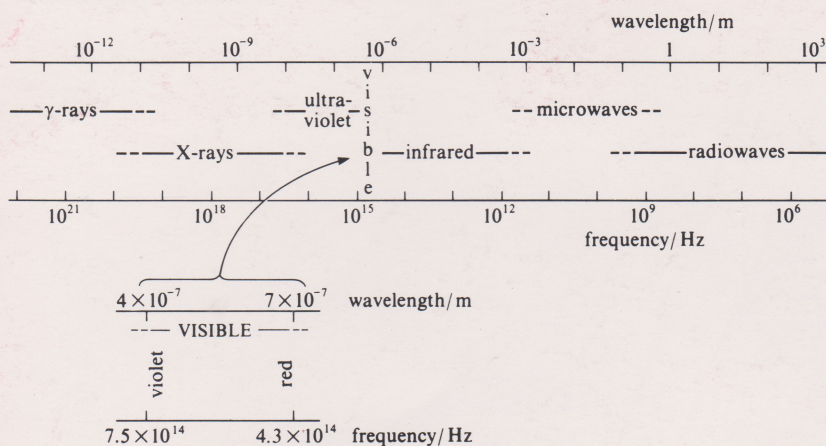


Unit 3
Motion under gravity

Unit 4
Practical work in science

USEFUL INFORMATION FOR THE PHYSICS AND GENERAL SCIENCE UNITS

ELECTROMAGNETIC SPECTRUM



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SI02 UNITS

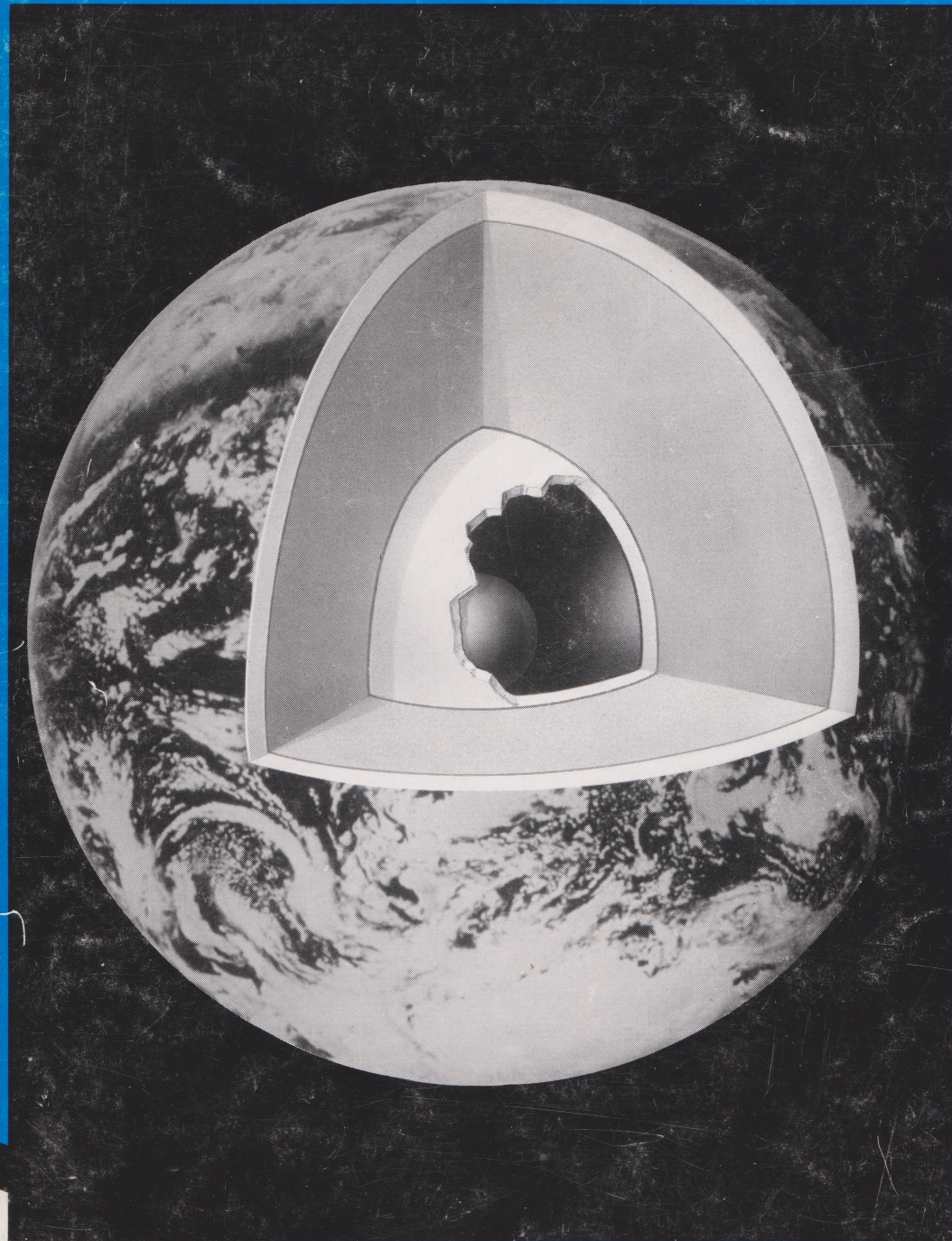
1	Science and the planet Earth	19	Life and evolution
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16	Chemical energetics	32	The search for fundamental particles
17-18	The chemistry of carbon compounds		

SI02 UNITS 5-6

THE OPEN UNIVERSITY
SI02: A SCIENCE FOUNDATION COURSE

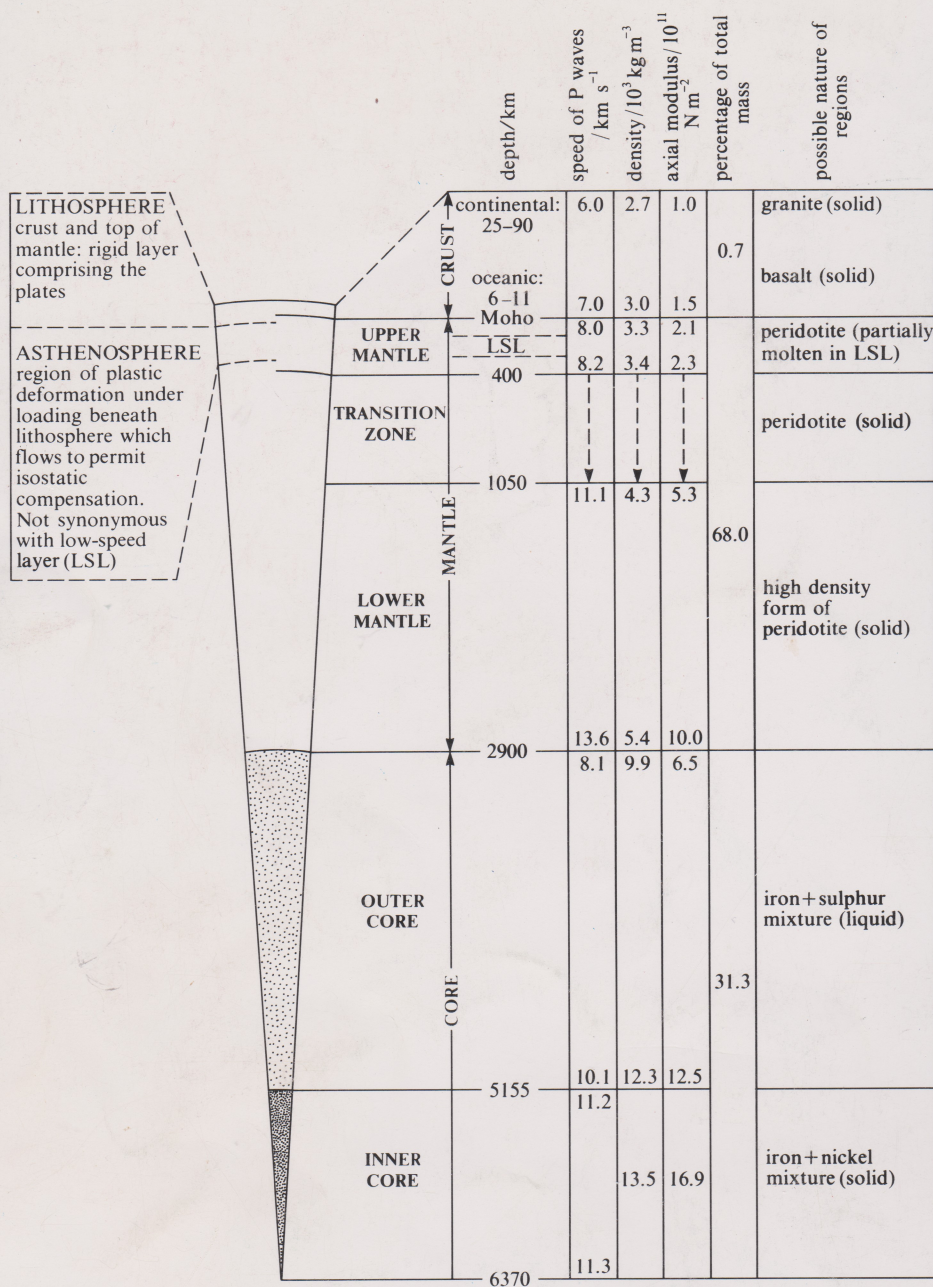


SCIENCE



Units 5-6
Into the Earth: earthquakes,
seismology and the Earth's magnetism

PROPERTIES OF THE EARTH'S INTERIOR



S102 UNITS

1	Science and the planet Earth	19	Life and evolution
2	Measuring the Solar System	20	Inheritance and cell division
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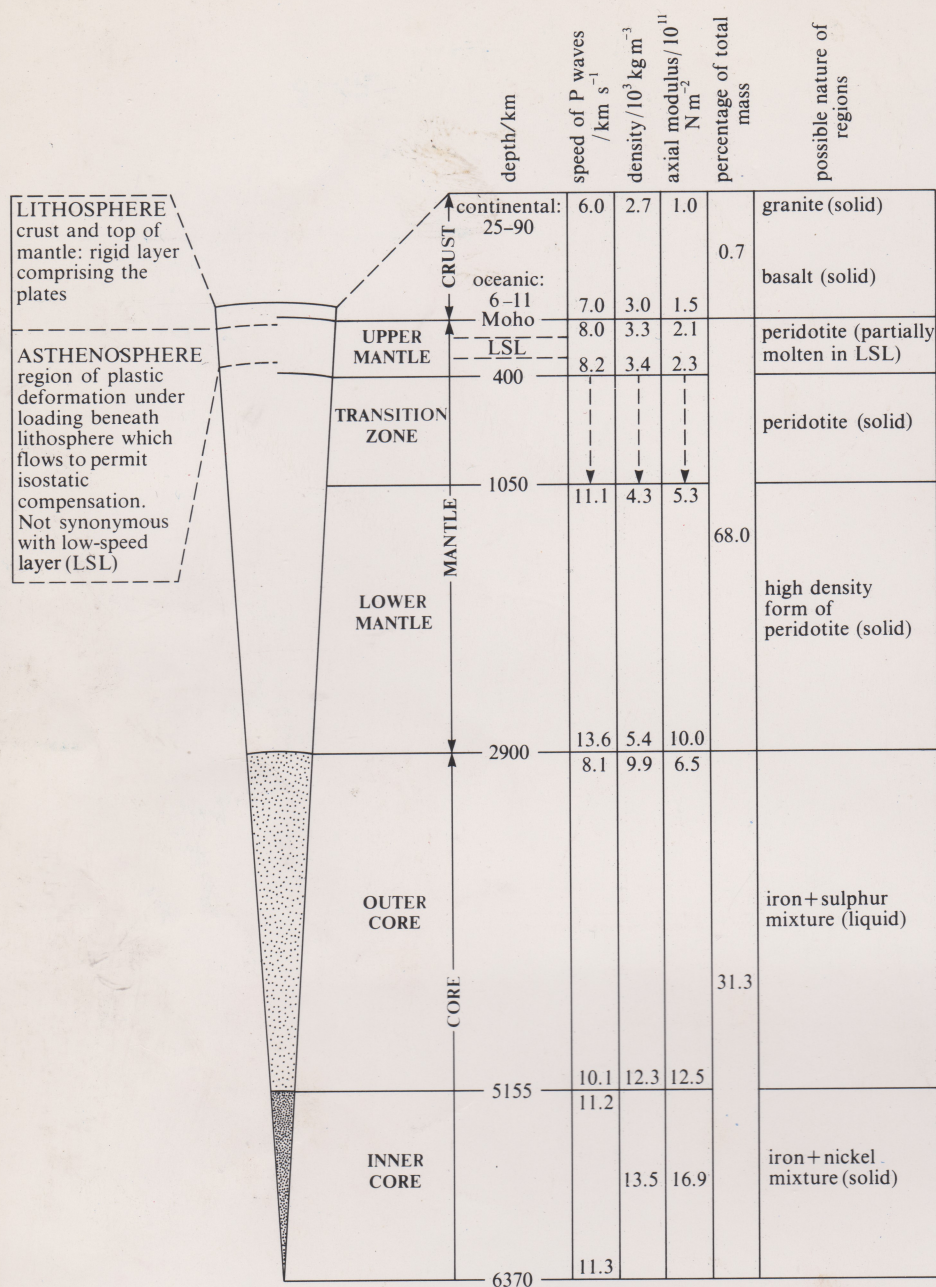


SCIENCE



Units 7-8
Plate tectonics:
a revolution in the Earth sciences

PROPERTIES OF THE EARTH'S INTERIOR

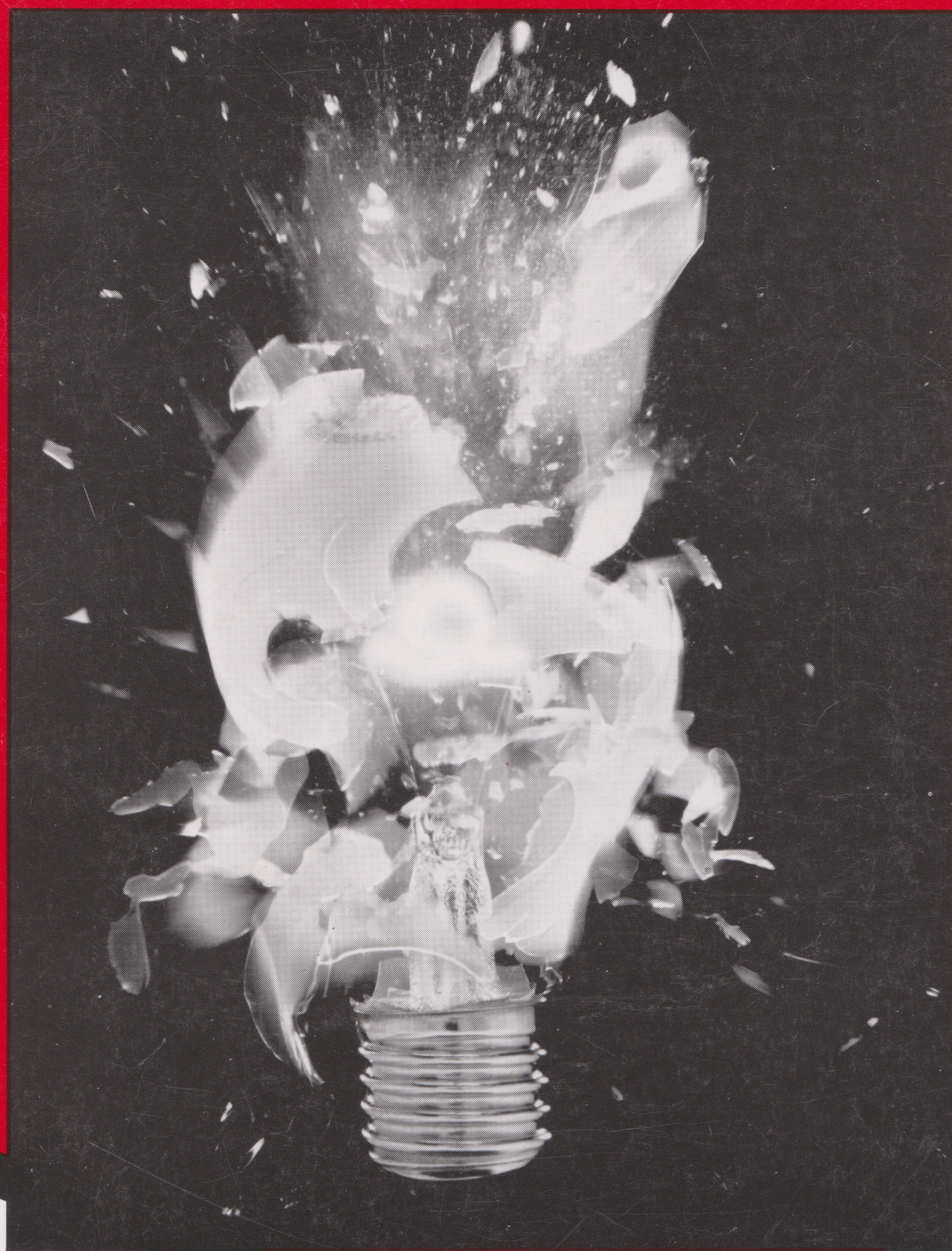


SI02 UNITS

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SCIENCE

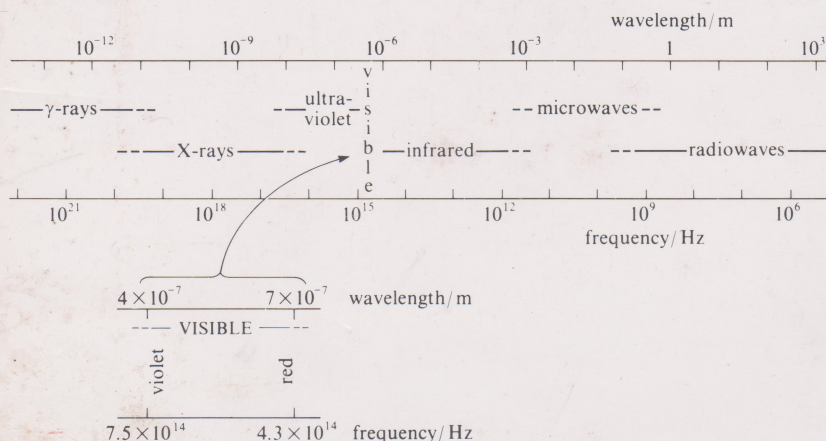


Unit 9
Energy

Unit 10
Modelling the behaviour of light

USEFUL INFORMATION FOR THE PHYSICS AND GENERAL SCIENCE UNITS

ELECTROMAGNETIC SPECTRUM



PHYSICAL CONSTANTS

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SCIENCE



Units 11-12
Atomic structure

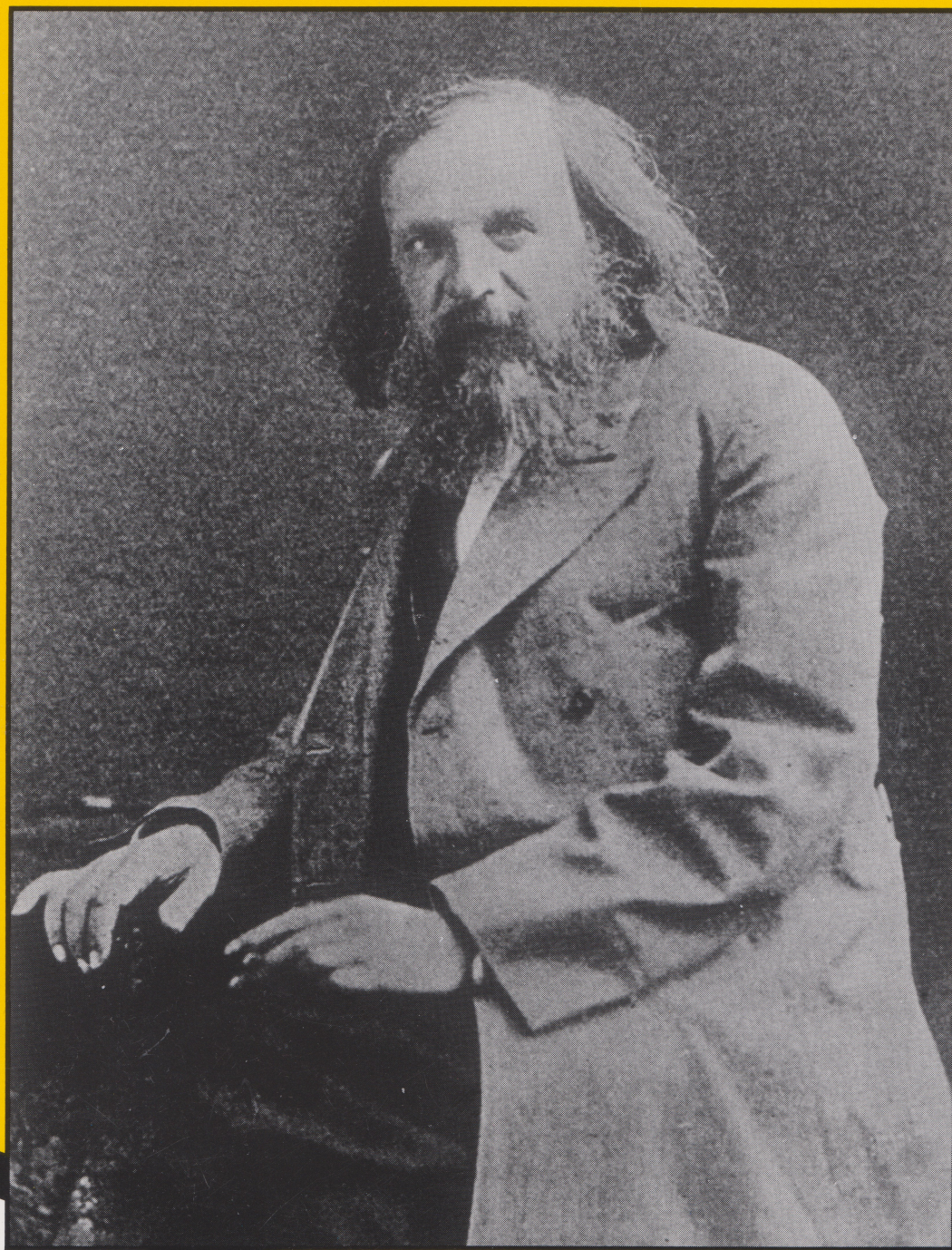
I II

S102 UNITS

ISBN 0 335 16330 0



SCIENCE



Units 13–14
Chemical reactions
and the Periodic Table

I II

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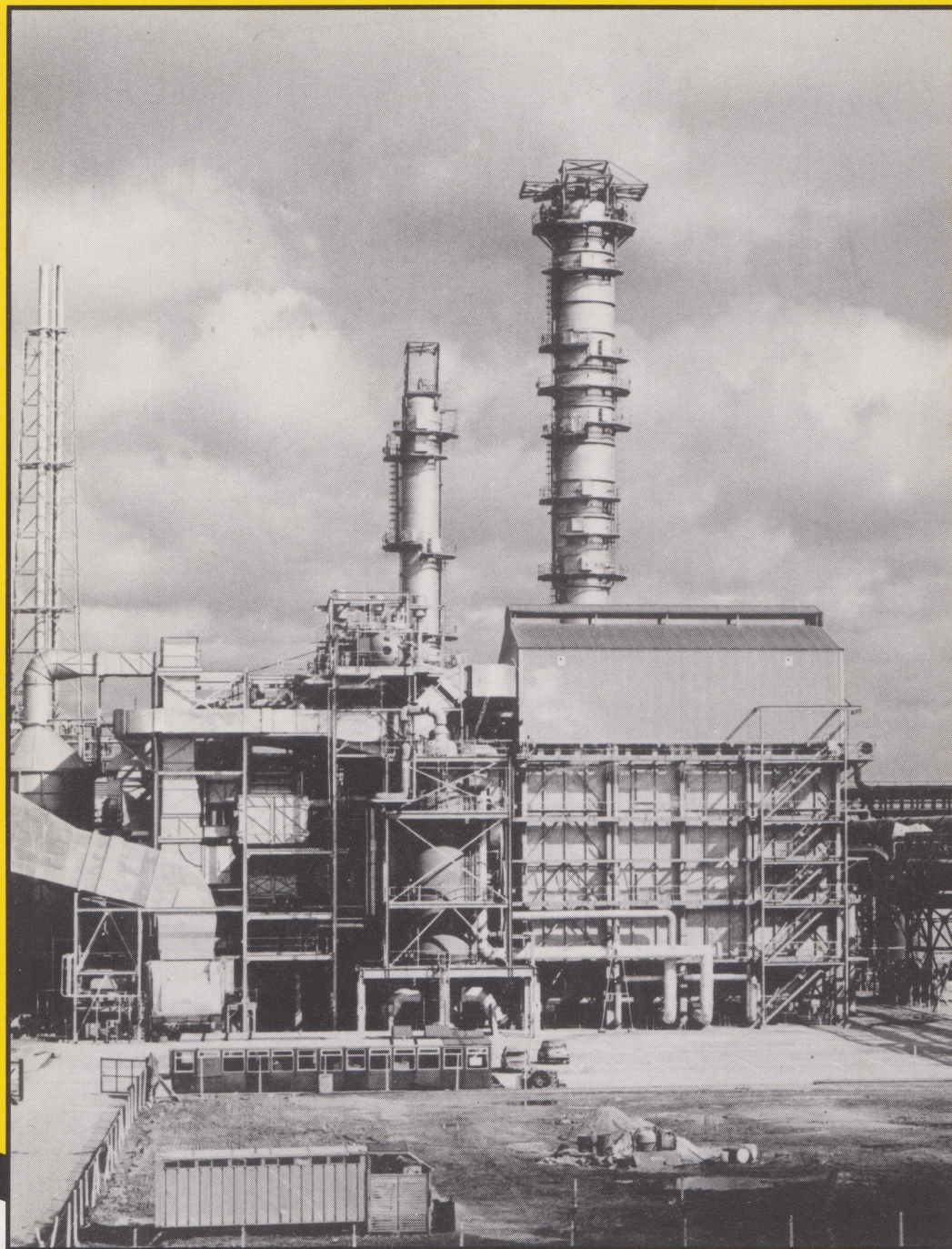
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SI02 UNITS 15 AND 16

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Unit 15
Chemical equilibrium

Unit 16
Chemical energetics

I II

S102 UNITS

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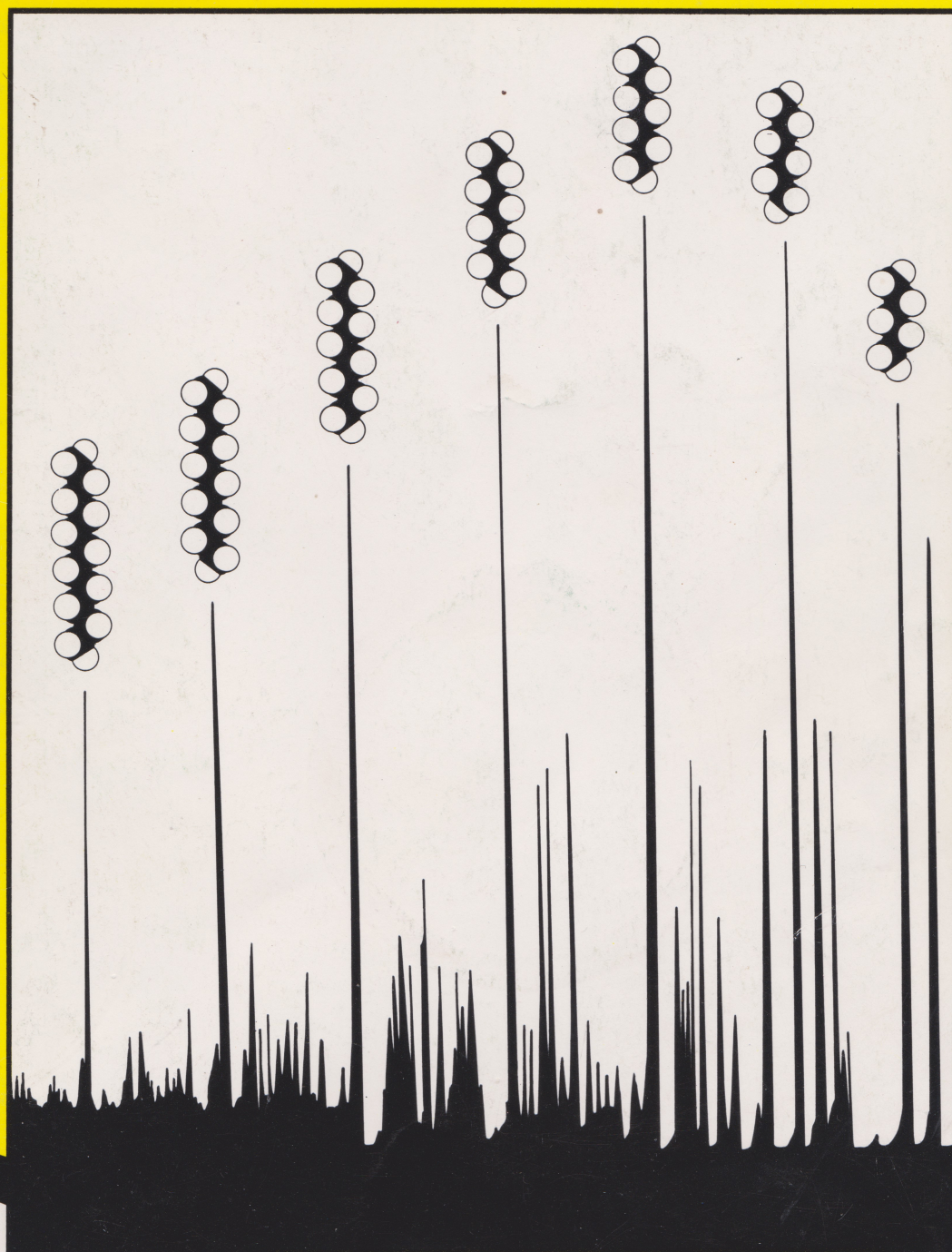
ISBN 0 335 16332 7

S102 UNITS 17-18

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SCIENCE



Units 17-18
The chemistry of
carbon compounds

THE PERIODIC TABLE

I	II											III	IV	V	VI	VII	0							
																	² He							
³ Li	⁴ Be											⁵ B	⁶ C	⁷ N	⁸ O	⁹ F	¹⁰ Ne							
¹¹ Na	¹² Mg											¹³ Al	¹⁴ Si	¹⁵ P	¹⁶ S	¹⁷ Cl	¹⁸ Ar							
¹⁹ K	²⁰ Ca	²¹ Sc	²² Ti	²³ V	²⁴ Cr	²⁵ Mn	²⁶ Fe	²⁷ Co	²⁸ Ni	²⁹ Cu	³⁰ Zn	³¹ Ga	³² Ge	³³ As	³⁴ Se	³⁵ Br	³⁶ Kr							
³⁷ Rb	³⁸ Sr	³⁹ Y	⁴⁰ Zr	⁴¹ Nb	⁴² Mo	⁴³ Tc	⁴⁴ Ru	⁴⁵ Rh	⁴⁶ Pd	⁴⁷ Ag	⁴⁸ Cd	⁴⁹ In	⁵⁰ Sn	⁵¹ Sb	⁵² Te	⁵³ I	⁵⁴ Xe							
⁵⁵ Cs	⁵⁶ Ba	57-70 lanthanides					⁷¹ Lu	⁷² Hf	⁷³ Ta	⁷⁴ W	⁷⁵ Re	⁷⁶ Os	⁷⁷ Ir	⁷⁸ Pt	⁷⁹ Au	⁸⁰ Hg	⁸¹ Tl	⁸² Pb	⁸³ Bi	⁸⁴ Po	⁸⁵ At	⁸⁶ Rn		
⁸⁷ Fr	⁸⁸ Ra	89-102 actinides					¹⁰³ Lr	¹⁰⁴	¹⁰⁵															
		transition elements																						
		typical elements																						



SCIENCE



Unit 19
Life and evolution

Unit 20
Inheritance and cell division

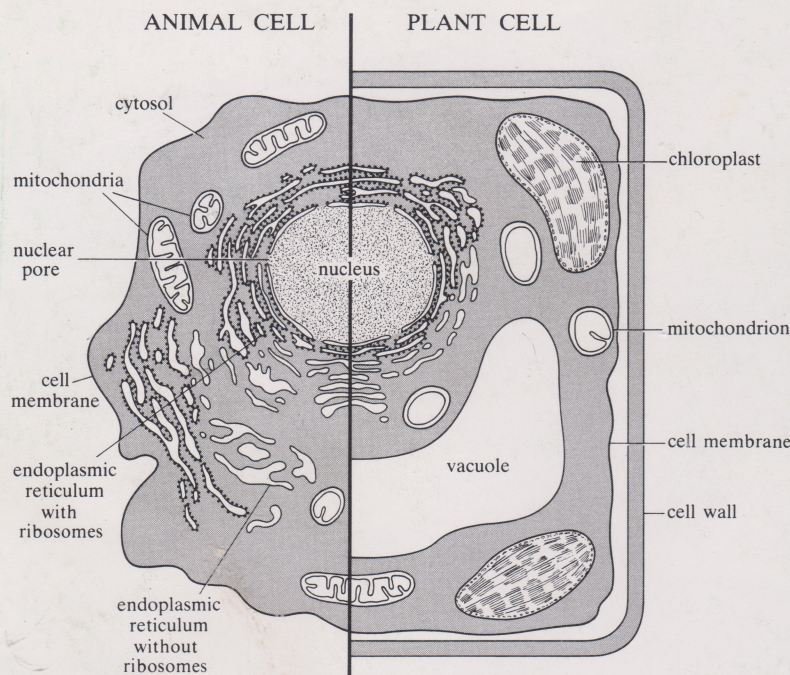
Unit 21
Genes and evolution

USEFUL INFORMATION FOR THE BIOLOGY UNITS: CHEMICALS, CELLS AND CLASSIFICATION

All cellular organisms contain these four biopolymers (made up of the monomers shown below).

Biopolymers:	polysaccharides	proteins	DNA	RNA
Monomers:	monosaccharides	amino acids	deoxyribonucleotides	ribonucleotides

All eukaryotic organisms have cells of the following generalized structure.



All living organisms can be divided into four kingdoms. The figures in brackets show the number of species (in thousands) in each subkingdom.

Animals	Plants	Fungi	Prokaryotes
sponges (4)	eukaryotic algae (20)	slime moulds (0.5)	bacteria (1.6)
unicells (40)	true plants (330)	true fungi (100)	blue-green bacteria
multicells			(formerly termed blue-green algae)
(1 000–2 000)			(1.5)

S102 UNITS

1	Science and the planet Earth	19	Life and evolution
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17–18	The chemistry of carbon compounds	32	The search for fundamental particles

SI02 UNITS 22 AND 23

THE OPEN UNIVERSITY
SI02: A SCIENCE FOUNDATION COURSE



SCIENCE



Unit 22
Biochemistry

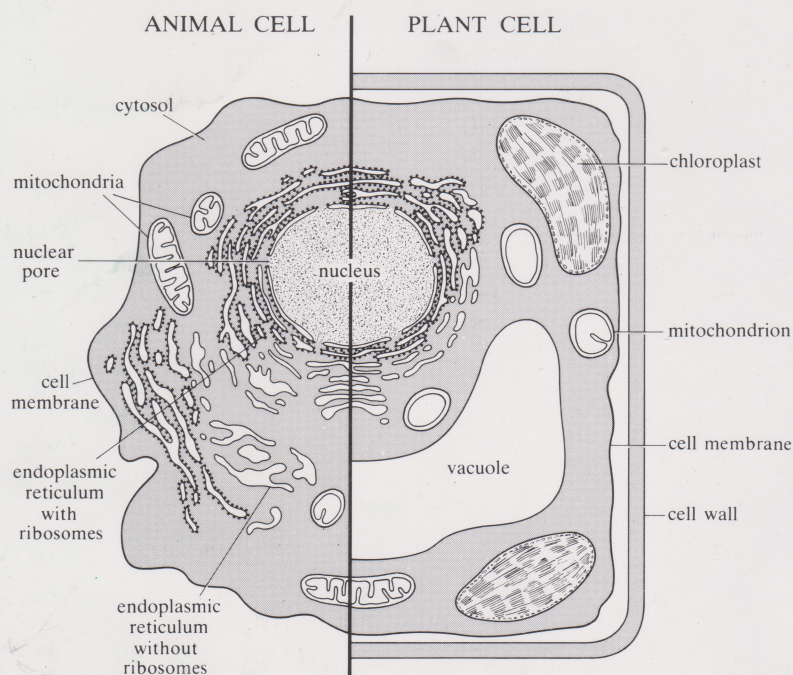
Unit 23
Physiology

USEFUL INFORMATION FOR THE BIOLOGY UNITS: CHEMICALS, CELLS AND CLASSIFICATION

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SI02 UNITS

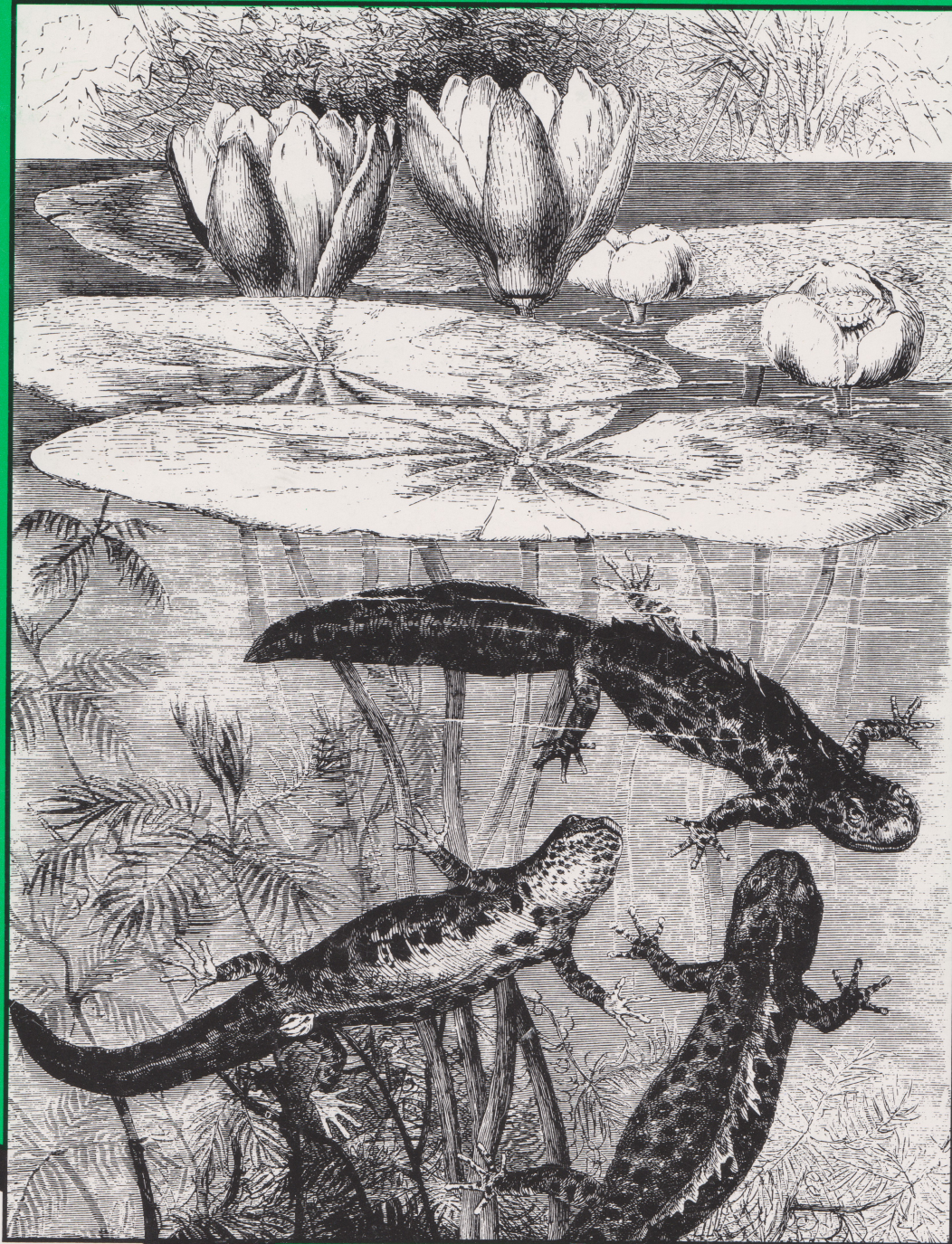
1	Science and the planet Earth	19	Life and evolution
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SI02 UNITS 24, 25 AND 26

THE OPEN UNIVERSITY
SI02: A SCIENCE FOUNDATION COURSE



SCIENCE



Unit 24
DNA: molecular
aspects of genetics

Unit 25
Ecology

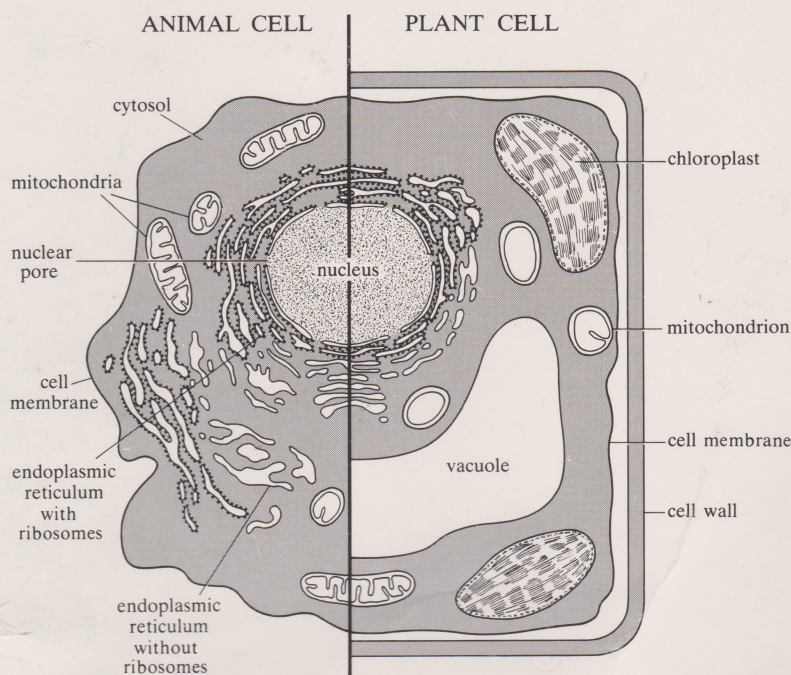
Unit 26
Biology reviewed

USEFUL INFORMATION FOR THE BIOLOGY UNITS: CHEMICALS, CELLS AND CLASSIFICATION

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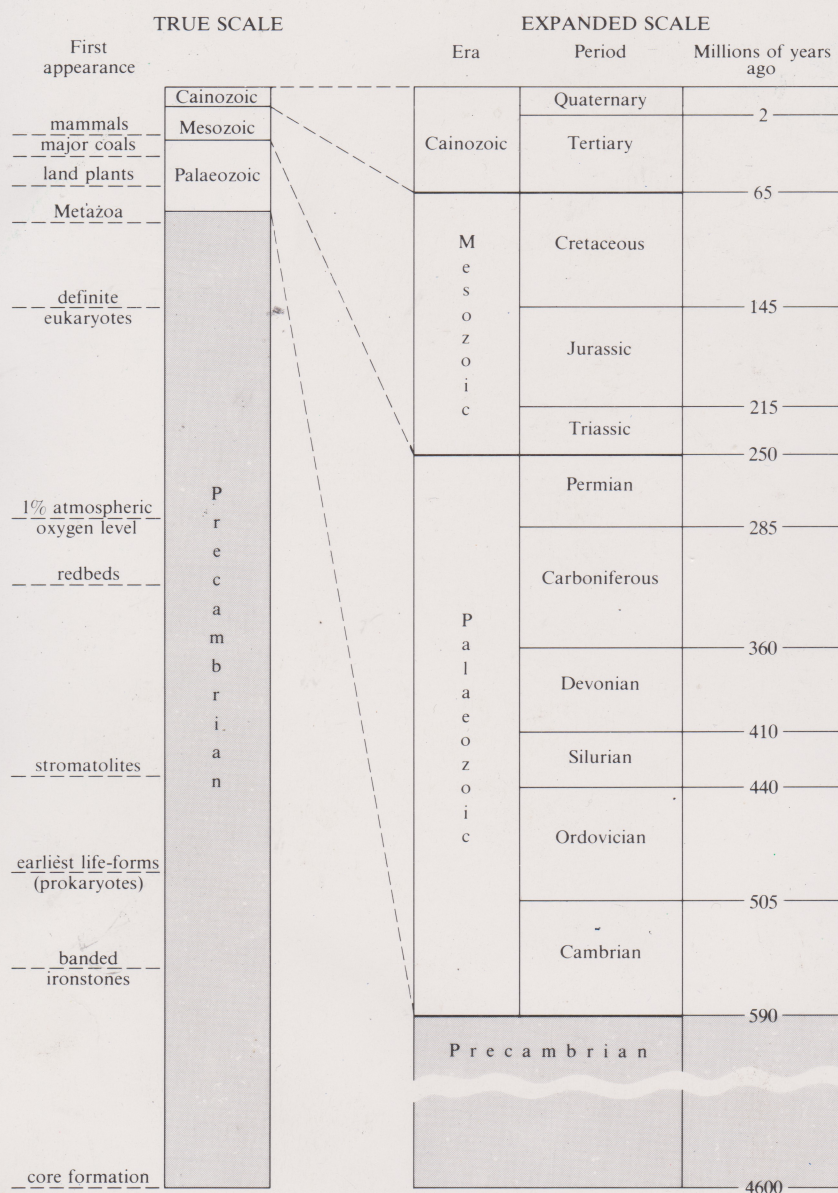
SCIENCE



Unit 27
Earth materials and processes

Units 28 – 29
Geological time and Earth history

EARTH HISTORY AND STRATIGRAPHIC COLUMN

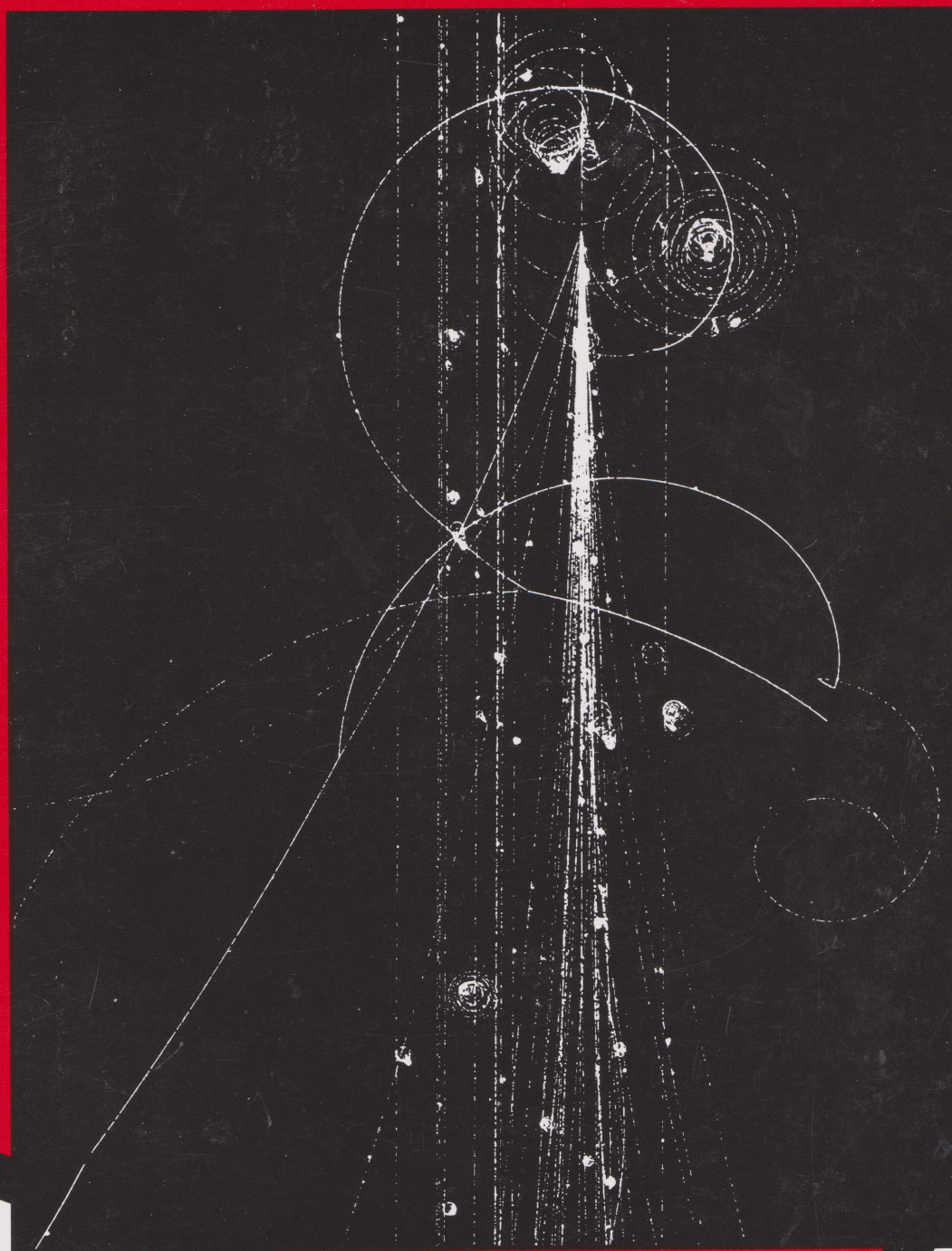


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SCIENCE



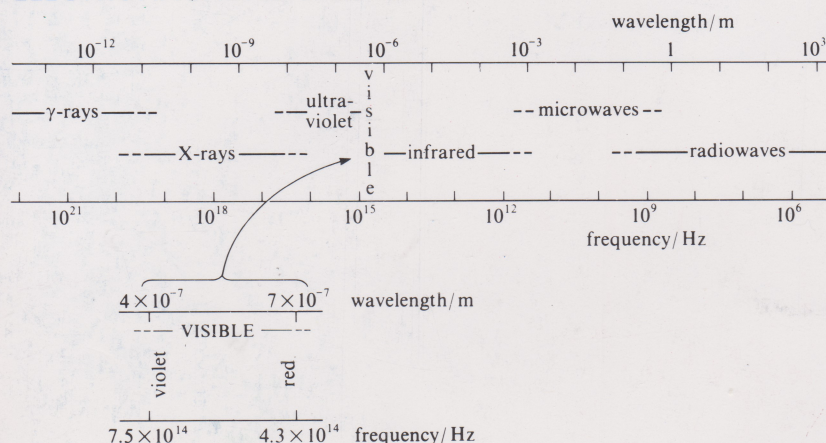
Unit 30
Quantum mechanics:
an introduction

Unit 31
Quantum mechanics:
atoms and nuclei

Unit 32
The search for fundamental particles

USEFUL INFORMATION FOR THE PHYSICS AND GENERAL SCIENCE UNITS

ELECTROMAGNETIC SPECTRUM



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